DOCUMENT RESUME

ED 092 361 SE 017 727

AUTHOR Prince, Fred L.
TITLE The Prediction of Subject Matter Bias Related to Science in the Elementary Schools.
PUB DATE Apr 74
NOTE 4p.; Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (47th, Chicago, Illinois, April 1974)

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Attitudes; *Educational Research; *Elementary School Teachers; Science Education; *Teacher Attitudes; Teacher Education
IDENTIFIERS School Subject Inventory

ABSTRACT

Reported is a study whose purpose was to produce preliminary validation information for an instrument designed to measure the bias of elementary school teachers toward four disciplines: science, mathematics, social studies and language arts. One hundred fifty elementary education majors were given a 36-item inventory with each item designed to elicit biased responses between pairs of school disciplines, using a five-point scale of bias between the members of the pair. Reliability and validity of the instrument were computed. Preliminary data suggested that this inventory was a highly reliable instrument. (Author/PEB)

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED 092361

THE PREDICTION OF SUBJECT MATTER BIAS RELATED TO SCIENCE IN THE ELEMENTARY SCHOOLS

Fred L. Prince
University of South Florida
Tampa, Florida

Science educators have been faced with a number of problems when considering the effectiveness of their methods courses for elementary education majors. Not the least of these is a lack of ability to predict the impact of their teaching techniques upon the subject matter biases of their students. There has been no existing instrumentation that enables the instructor in science methods to examine the attitudes of his students toward the four major subject disciplines typically taught in the elementary grades, science, social studies, language arts and mathematics.

PROBLEM:

Attitudes toward the teaching of science must be taken in the context of attitudes toward the other major subject areas, and any instrument that may be used to relate teacher attitudes between subjects must be validated in such a way that the attitudes of the teachers toward the subject are correlated with actual behavior in the schools. Usefulness of such an instrument is directly associated with its ability to predict behavior of teachers in the schools that may illustrate bias toward specific subject areas.

These were the goals in development of the "School Subject Inventory".

INSTRUMENT DESIGN:

The restriction of working with the four major subject areas simultaneously dictated the general pattern followed in the "School Subject

SE 017 727

Inventory". The instrument is therefore based upon paired comparisons as follows:

In general, I would feel comfortable teaching science ( ) teaching Social Studies.

The subject is required to complete the statement with one of the following phrases:

a. much more than

b. a little more than

c. about the same as

d. a little less than

e. much less than

The thirty six (36) items on the instrument result in each of the four subject areas being used in eighteen (18) statements. Any subject area must receive a score of between minus thirty six (-36) and positive thirty six (+36) points, with a score of zero (0) indicating no bias toward the subject. Bias toward one subject will result in a degree of bias against one or more other subjects. One subject scale may be scored with no reference to other scales, or all four scale scores may be used to produce a subject bias profile for each S.

The instrument was designed to provide an adequate number of items for acceptable reliability, while being short enough to be feasibly (average time required is less than fifteen (15) minutes)

VALIDATION TECHNIQUES:

The reliability of the "School Subject Inventory" was estimated through the use of a split-half technique utilizing Pearson's product moment coefficients of correlation as the first and second halves of the instrument contain similar items arranged in random order. The preliminary

sample of undergraduate elementary education majors was drawn from approximately equal numbers of students enrolled in science (n=112) and social studies (n=91) methods courses bringing the total number of subjects to 203.

The reliability coefficients for the sample tested are as follows: (corrected using Spearman-Brown prophecy formula):

Science subscale	r = .92
Language arts subscale	r = .92
Social studies subscale	r = .95
Mathematics subscale	r = .95

As this instrument is designed to yield a profile of scores, the reliability of elicited profiles was estimated using Mosier's formula. Based upon the preliminary data, the coefficient of reliability of profile scores for the "School Subject Inventory" is .89.

Preliminary estimation of the degree of validity of the instrument was achieved through correlating subscale scores of a sample of 51 elementary school teachers with a second instrument. The teachers were told at a faculty meeting that their school district was considering departmentalization in the elementary grades, or at least assigning specific teachers within pods the task of concentrating in one subject area. The teachers were then asked to express their opinion about being required to concentrate upon teaching the four major subject areas (retest reliability $\sim$ .90). Upon completion of this questionnaire, the teachers were administered the "School Subject Inventory". A Pearson's r was used to estimate the relationship between the responses on the two instruments.

The validity coefficients derived in this manner and corrected from unreliability in the criterion instrument were as follows (n=51):

Science subscale	r = .71
Language arts subscale	r = .65
Social studies subscale	r = .80
Mathematics subscale	r = .63

CONCLUSION:

While the data presented here are preliminary, the "School Subject Inventory"seems to possess adequate reliability and validity of scores to make it useful for investigating the attitudes of teachers toward the four major subject areas typically taught in the elementary school. It should be of assistance in assessing the effectiveness of courses designed for elementary school teachers as well as in other research.

SUGGESTED APPLICATION:

The School Subject Inventory may be of use in the following research areas:

1. Evaluating the effectiveness of teaching techniques and topics related to science methods courses.
2. Examining subject matter biases of elementary teachers in the field.

Other uses may be apparent to the reader.

Persons interested in using the "School Subject Inventory" may receive a copy of the instrument and scoring keys from the author. Please enclose a self-addressed envelope and a request for the use of the instrument.